

Biogeography: The Study of More Than "Um, Biology and Geography

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I can still remember the first day of class when Professor Menke, in his first year teaching at Lake Forest College, asked his students to define biogeography, the title of the course. Most responded with the pithy and uncertain statement, "Umm, biology and geography." As a course that had never been offered at Lake Forest before, biogeography was a subject unexamined by the majority of biology majors at the College. It is safe to say that no one, besides Professor Menke of course, really knew what biogeography was. By the end of the semester, however, the twelve students taking this class knew that the study of biogeography involved much more than just "biology and geography" and were able to articulate important themes and issues surrounding the discipline today.

Biogeography is, for the record, the study of the distribution of organisms, species, and ecosystems in geographical space and through geological time. It is the study of where organisms come from, where they go to, and what happens when they get there. It involves describing and explaining patterns of distribution and abundance. While particularly stimulating for the ecology-minded biology major, biogeography is a wide-ranging and interdisciplinary study that is capable of appealing to a diversity of students, from computer science and biochemistry majors to those studying politics and economics.

Taking Biogeography taught me to think like a biogeographer, an important lesson not assumed by every student in every course. I learned to use the tools that biogeographers use and to present and discuss issues as a biogeographer would. Each week, my classmates and I would take on a new subject in biogeography, ranging from phylogenetics to plate tectonics. The week would begin with an orienting lecture from Professor Menke and progress into two class discussions: one centered on a foundational concept presented early in biogeography's history and the other involving new advancements on the particular topic. In each class discussion, students were expected to draw on concepts already introduced in previous lectures in addition to the reading assigned for that day.

All students are responsible for leading two class discussions during the semester, giving them the chance to determine the critical issues of a concept or experiment and find ways to relate these issues to the class. It demands a deeper analysis of the material. It requires mastery of the topic and the knowledge of how to craft and sustain a fruitful discourse. Practicing these skills as students will undoubtedly facilitate professional interactions and relationships later in life.

One particularly robust discussion between my classmates and I dealt with 'rewilding' North America with the megafauna that inhabited the continent many years ago. In the discussion, we had to consider the ecological implications that the proposed 'sweepstakes routes' of, say, elephants and camels might have on humans, ecosystems, and the transported animals themselves. As one of the last debates of the semester, I was surprised at how much knowledge I was able to apply to such a seemingly abstract topic. I thought about range sizes, fundamental niches, interspecies interactions, qualities of invasive species, community organization, dominance, and paradigms for distinguishing and comparing species. I identified the assumptions and critical issues in each argument and



Students of biogeography must consider the genetics, geological location, and ecological requirements of an organism to understand why and how it lives where it does.

responded to them. As a class, we also attempted to design experiments that might clarify ecological inconsistencies or uncertainties in our debates. This process of careful analysis and application felt authentic and meaningful.

For the lab portion of the course, students gained unofficial certification in GIS, or geographic information systems. GIS is one of the most revolutionary advancements in the study of biogeography and provides the tools necessary to respond to some of the most fascinating questions in biogeography today. More broadly, it allows scientists and researchers from all disciplines to combine data layers from different sources in order to better understand and compare patterns. In lab, I completed online training courses in GIS and applied the concepts and skills I learned to make maps and extract data for a project of my own. As a technology that is becoming more readily applied to all studies, disciplines, and projects, becoming familiar with the basic methods and principles of GIS is incontrovertibly relevant to many students' future careers.

Not only did I learn more about barriers to dispersal and the appropriate scales for studying certain phenomena, I also became acquainted with the real concerns and activities of biogeographers. I was expected to perform as a biogeographer, responding to data and considering experiments as a biogeographer would. After taking this course, I can give people much more than an accurate description of what biogeography is; I can tell them, better yet show them, how biogeography is done and why biogeography matters.

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